

In the Claims

- 1 - 56. (cancelled)
57. (new) A method of sowing seed comprising the steps of:
- (a) breaking up soil only where seed is to be planted by pulling laterally spaced apart first tines therethrough with the tines set to penetrate a depth which bears a fixed relationship to the depth at which the seed is to be sown, to create a corresponding plurality of shallow trenches of broken up soil with strips of undisturbed soil therebetween,
 - (b) at a distance behind and in line with each of the first tines, introducing seed immediately to the rear of a second tine via seed delivery means associated with the second tine, the penetration depth of the second tine being equal to the depth at which the seed is to be sown in the trench, and
 - (c) flattening the soil in the trenches by levelling means aligned with and following the tines.
58. (new) A method as claimed in claim 57 wherein the second tines penetrate to substantially the same depth as the first tines.
59. (new) A method as claimed in claim 57 wherein the second tines penetrate to substantially the same depth as the first tines and wherein the second tines include lateral wings to break up and lift the soil to facilitate the deposition of seeds at the bottom of each trench.
60. (new) A method as claimed in claim 57 wherein the second tines penetrate to part of the depth of the trenches created by the first tines.
61. (new) A method as claimed in claim 57 wherein the second tines penetrate to part of the depth of the trenches created by the first tines wherein laterally extending wings on the second tines lift and spread the soil broken up by the first tines near the top of each trench, and the seed

is introduced below the lifted soil, so that the seed is covered by the soil as it drops back into the upper region of each trench.

62. (new) A method as claimed in claim 51 wherein the second tines penetrate to a greater depth than the first tines.

63. (new) A method as claimed in claim 57 wherein the second tines penetrate to a greater depth than the first tines and wherein the second tines include lateral wings to break up and lift the soil at the bottom of the trenches formed by the second tines to facilitate the deposition of seeds at the bottom of each trench formed by the second tines.

64. (new) Apparatus for cultivating soil and sowing seed comprising:

- (a) a frame, adapted in use to be towed by, or attached to the rear of, a tractor,
- (b) a first row of tines carried by the frame and spaced apart across the width of the frame,
- (c) a second row of tines also carried by the frame and spaced to the rear of the first row in the direction of forward motion of the apparatus when in use, and the second row tines are similarly spaced apart across the width of the frame so that each of the tines in the second row is aligned with one of the tines in the first row whereby in use soil will only be disturbed in spaced apart linear regions determined by the lateral spacing of the tines, and the strips of soil therebetween will not be disturbed,
- (d) a hopper means containing seed,
- (e) means for feeding seed therefrom down the rear and to the underside of each of the second tines,

(f) soil levelling means carried by the frame and located in alignment with the tines to the rear of the second row of tines (relative to the said forward direction of motion when in use), so that in use as the apparatus moves in a forward direction, soil that has been disturbed by the tines is generally flattened by the passage of the levelling means thereover.

65. (new) Apparatus as claimed in claim 64 wherein the penetration depth of at least some of the tines is adjustable relative to the frame.

66. (new) Apparatus as claimed in claim 64 wherein the height of the levelling means is adjustable, and in use the height is adjusted to create just sufficient pressure on the soil so as to compact the soil above and in the region of the seed, to create good soil to seed contact.

67. (new) Apparatus as claimed in claim 64 wherein the tines in the second row include lateral wings which in use lift the disturbed and broken up soil in the trench created by the first tines, as the second tines move therethrough, to allow seed to fall below the lifted soil which, as the second tines continue to move forward, will fall back to cover the seed before the soil is flattened by the following levelling means.

68. (new) Apparatus as claimed in claim 64 wherein the hopper means containing the seed is a single hopper carried centrally of the frame.

69. (new) Apparatus as claimed in claim 64 further comprising pneumatically powered seed delivery means which in use operates to deliver seed from the hopper means to the seed delivery means associated with each of the second row of tines.

70. (new) Apparatus as claimed in claim 64 wherein a separate seed hopper is mounted above each of the tines in the second row of tines.

71. (new) Apparatus as claimed in claim 64 wherein the frame is adapted to be attached to a 3-point linkage at the rear of the tractor, so that in use the overall height of the frame and its angle of inclination relative to the ground, can be adjusted.
72. (new) Apparatus as claimed in claim 64 wherein the frame includes depth controlling wheels ahead of the first row of tines.
73. (new) Apparatus as claimed in claim 64 further comprising road wheels and a drawbar which extends forwardly of the frame for attachment to a towing hook on the tractor, to allow the frame to be trailed behind a tractor.
74. (new) Apparatus as claimed in claim 64 wherein the spaced apart rows of tines and soil levelling means are arranged in parallel spaced apart V formations.
75. (new) Apparatus as claimed in claim 64 wherein each of the tines in the first row is independently adjustable for depth of work.
76. (new) Apparatus as claimed in claim 64 wherein each of the tines in the second row is independently adjustable for depth of work.
77. (new) Apparatus as claimed in claim 64 to wherein each of the second tines are S-shaped spring tine.
78. (new) Apparatus as claimed in claim 64 to wherein each of the second tines are S-Shaped spring tine.
79. (new) Apparatus as claimed in claim 64 wherein wheels are mounted on the frame so that in use they follow the tines to flatten and compact the soil.

80. (new) Apparatus as claimed in claim 64 wherein each of the second tines is a S-shaped spring tine and one wheel is provided for each second tine, each wheel is attached by a rigid arm to the centre of the S-spring of its associated second tine, and the upper part of the spring serves in use to exert a downward force on the wheel through the arm and thereby through the wheel to the soil.

81. (new) Apparatus as claimed in claim 64 wherein road wheels are attached to the frame and are adapted in use to be lowered for trailing the machine behind a tractor and to be raised when the apparatus is to be used for cultivating and sowing.

82. (new) Apparatus as claimed in claim 64 wherein road wheels are removably attached to the frame so that the weight of the machine can be reduced when in use for cultivating and sowing, by removing the wheels.

83. (new) Apparatus as claimed in claim 64 wherein the frame is constructed from at least two sub-frames which are adapted to be locked in use in at least two configurations, in one of which the sub-frames adopt a layout for drilling and in another of which at least one of the sub-frames is folded or inwardly, to reduce the overall width of the machine for transport on roads or manoeuvring in restricted spaces.

84. (new) Apparatus as claimed in claim 83 wherein at least one of the sub-frames is adapted to overlie at least one other of the sub-frames after it has been folded inwardly.

85. (new) A method of soil cultivation and seed sowing using apparatus as claimed in claim 64 which in use is adapted to cultivate the soil only where the seed is to be planted, thereby creating a conservation tillage by not disturbing the soil between the seeded rows, so that weed seed in the soil between the seeded rows will tend not to germinate because the soil between the rows has not been disturbed.

86. (new) A method of soil cultivation and seeding previously cropped land using apparatus as claimed in claim 64 which in use operates as a direct drill in residue such as straw and stubble of the previous crop, in which the passage of the tines through the soil moves the crop residue onto the soil between the seeded rows, to serve as a mulch.

87. (new) A method of soil cultivation and seeding previously cropped land using apparatus as claimed in claim 64 which in use operates as a direct drill in residue such as straw and stubble of the previous crop, in which the passage of the tines through the soil moves the crop residue onto the soil between the seeded rows, to serve as a mulch

and wherein prior to the cultivating and sowing step the previous crop residue is chopped and spread evenly over the ground.